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# Examining the role of language on students achievement: a study on the use of second language as a medium of instruction in teaching science subject in Malaysia

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## Abstract

This study aimed to identify the role of second language (English) through the examination of relationship between students self efficacy and achievement motivation with their achievement. Results of the study found significant relationship between self efficacy in English language and achievement motivation with students' achievement in science which is taught in English. The study also found significant differences in self efficacy and achievement motivation according to socio-economic status (SES). Results of the study supported the importance of language and the need to address the influence of SES level to students' self efficacy in the language, achievement motivation and performance.

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**Keywords:** self efficacy; achievement motivation; science subject; socioeconomic status; second language

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## 1. Introduction

The use of English as a medium of instruction for Science and Mathematics subjects in Malaysian education system since 2003 invites issues regarding its impact on students learning. Learning from socio-cultural perspective, as suggested by Vygotsky stressed the importance of language in cognitive development (Woolfolk, 2008). Hence the use of English which is a second language in Malaysia as a medium of instruction in teaching Science may affect students' performance on the subject. This study examine the role of language through the study of students self efficacy in English language and its relationship to their achievement motivation and performance in science subject.

Many studies have been conducted on factors that affect learning and achievement of students in schools. Previous studies indicated that many factors are associated with students' academic achievement. Among the factors that are given attention by researchers are self efficacy and achievement motivation. Review of literature showed that self efficacy and achievement motivation play an important role in determining student's academic achievement. Review of literature showed that self efficacy and achievement motivation play an important role in determining a

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student's academic achievement. Hence, the strength of self efficacy and achievement motivation should be identified in order to help students enhance their performance.

Self-efficacy is one of the factors that are important to produce excellent students. Students who believe that they are able to do certain tasks will have a high confidence and will obtain higher results. On the contrary, individuals who have low self efficacy tend to avoid doing tasks and incline to be in despair when facing difficulties or problems. Self efficacy is closely related to self-motivation because it is belief that it affects one another. High self efficacy will increase motivation and at the same time high self efficacy can also increase achievement motivation (Woolfolk, 2008).

Achievement motivation has been defined as the tendency of an individual to obtain satisfaction based on the success obtained which is based on the degree of excellence. Achievement motivation can be defined as the need for success or the attainment of excellence. Individuals will satisfy their needs through different means, and are driven to succeed for varying reasons both internal and external. Many studies conducted by psychologists found that there is a relationship between achievement motivation and the achievement of an individual in any field.

In the context of this study, student's self efficacy in English language and achievement motivation in Science subject which is taught in English were examined to identify the role of language on student achievement as suggested by Vygotsky's Socio-cultural theory.

### *1.1. Self Efficacy*

Bandura (1986) defines self efficacy as an individual opinion about his/her ability to plan and implement actions required to achieve specified targets. The belief of students' efficacy about academic ability affects their learning behavior and their academic achievement. Pajares (1997) also stated that students with high self efficacy will try to overcome the difficult tasks and accept the task as a challenge to master rather than avoiding these tasks. According to Schwarzer (1992), self efficacy is a belief that a person is capable of implementing a new and difficult task, or capable of facing difficulties in various domains of life.

Most forms of behavior shown are derived from thinking. Beliefs of students' efficacy affect their thinking processes in determining the goals and making plans when facing a task. The individual beliefs on self efficacy influence their action. This is explained by Bandura (1993) where he says that those who have high self efficacy will illustrate the success of providing positive support to an achievement. Those who have feelings of doubt on their self efficacy will always portray failure in dealing with matters that may affect their performance.

Self efficacy can be divided into two categories, namely high self efficacy and low self efficacy. Individuals, who have high self efficacy set high goals as challenges, maintain high participation and enhance the ability to face failure. They set high goals and strive to achieve them. The forms of action have in fact been in a person's thinking. It acts as optimistic or pessimistic depending on the individuals self efficacy level. Individuals, who have high self efficacy, will work hard. When confronting with failure, they will be able to overcome and sustain commitment in achieving goals (2002). Individuals with low self efficacy always regard tasks as being difficult and have narrow mission to finish it. For them, failure signals the inability in them. In this study, self efficacy refers to the self-confidence of a student ability and capability in using English in learning Science subject.

### *1.2. Achievement Motivation*

Motivation is a desire or a strong spirit of the person who pushed himself/herself to work or do something in order to achieve success. There are various types of motivation, but only achievement motivation will be discussed in this study. Generally, achievement motivation is an effort to force or encourage a person to try and maintain or achieve a better result in certain situations. According to Atkinson (1964), achievement motivation is an internal state that leads and accelerates the move of behavior towards one goal.

Literature reviews showed that individuals with higher achievement motivation will show better performance than those with lower achievement motivation. This can be associated with the effort shown by individuals who have high achievement motivation where students are motivated to demonstrate high achievement when confronted

with a task. Past studies have shown that individuals who are motivated will have more interest in school work given by teachers and eventually will show better performance. In this study, achievement motivation refers to the desire and the spirit to learn Science in English and achieve success in science subjects at school.

## 2. Purpose of the study

This study is carried out in reaction to the use of English language as a medium of instruction in teaching Science and mathematics in primary and secondary schools in Malaysia which was implemented since 2003. Although the policy will be revoke beginning January 2012 but its implementation provides an opportunity to explore the extent of the influence of second language to students' learning process. It is hypothesized that students' self efficacy in the second language (English) have an impact to their achievement motivation and performance in the subjects. The main purpose of this study was to identify the relationship between self efficacy and achievement motivation on Science achievement. In addition, this study also aimed to identify: 1) if there is any relationship between self efficacy and achievement motivation with Science achievement, 2) if there is any differences in self efficacy according to gender, socioeconomic status and school location, and 3) if there is any differences in achievement motivation according to gender, socioeconomic status and school location.

## 3. Methodology

This study is a survey research which uses a questionnaire to collect data. One set of instrument was used to measure the self efficacy and achievement motivation in Science subject. 168 form four students from four schools took part in this study. The sample was chosen using stratified random sampling according to gender and school location. Instrument was used to measure students self efficacy and achievement motivation. Respondents were asked to rate the statement based on 1-5 likert scale ranging from strongly disagree to strongly agree. The focus of the study was to identify interrelationship between self efficacy and student motivation with their achievement in science subjects. Demographic factors also were taken into account such as school location and socioeconomic status. In this study, socioeconomic status (SES) was divided into three groups, namely group of high, medium and low SES taking into account the raw min scores for parental employment status, parents or guardian highest academic achievement and parental income. The SES distribution shows that there are 34 (20.2%) high SES students, a total of 76 (45.2%) medium SES students and a total of 58 (34.5%) low SES students (refer table 1).

Table 1 Distribution of Respondents Based on Socioeconomic Status (SES) level

	Frequency	Percent
Low SES	58	34.5
Moderate SES	76	45.2
High SES	34	20.2
Total	168	100

Data was analysed using descriptive and inferential statistics to answer the research questions which include the use of mean, Spearman and Pearson Correlation, t-test and one way ANOVA.

## 4. Results

### 4.1. Self Efficacy and Achievement Motivation

Table 2 shows the mean score and standard deviation for self efficacy and achievement motivation. Overall, the study shows the student's self efficacy and achievement motivation are at moderate level with the means are 3.22 and 3.15 respectively.

Table 2.1 Mean and standard deviation for students' self efficacy and achievement motivation

	Mean	Standard Deviation
Self Efficacy	3.22	0.52
Achievement Motivation	3.15	0.47

### 4.2. Correlation between Self Efficacy and Achievement Motivation

Pearson correlation analysis results show the relationship between achievement motivation and self efficacy is  $r = 0.737$ ,  $p = 0.000$ . Correlation coefficient values obtained showed that there was a significant positive relationship. This shows that self efficacy have strong relationships with achievement motivation.

Spearman analysis was used to test the relationship between self efficacy and achievement motivation with student achievement in science subjects. This is because the variables in the achievement of Science are in ordinal scale. Spearman correlation analysis results shows that the relationship between self efficacy and achievement is  $r = 0.258$ ,  $p = 0.001$ . The values obtained from the Correlation coefficient showed that there was a significant moderate to low positive relationship between self efficacy and achievement motivation.

Spearman correlation analysis results also showed that correlation exists between achievement motivation and science achievement with  $r = .295$ ,  $p = 0.000$ . The result showed that there was a significant relationship between achievement motivation and science achievement. However the relationship that exists between the two is at a low level.

### 4.3. Differences in Self Efficacy and Achievement Motivation according to gender, school location and socioeconomic status

Min score of self efficacy for male students (mean = 3.16) is lower than female students (mean = 3.25). However t-test results ( $t$  value = 0.28,  $p = 0.24$ ) showed that there was no significant differences in self efficacy between male and female students. Similarly, for the achievement motivation, mean for male students (mean = 3.11) is also lower than mean for female students (mean = 3.17) and the t test results ( $t = 0.20$ ,  $p = 0.42$ ) also shows that there is no significant difference in student achievement between male and female students.

In terms of school location, the result showed no significant differences in students' self efficacy according to location. The mean for urban students (mean = 3.27) was higher than the mean for rural students (mean = 3.16). However, the t-test results also showed no significant difference in self efficacy between urban and rural students. ( $t = 0.22$ ,  $p = 0.16$ ). While for achievement motivation, the mean for urban students (mean = 3.16) was higher than the mean for rural students (mean = 3.14) but the t-test results also showed no significant difference in achievement motivation between urban and rural students ( $t = 0.76$ ,  $p = 0.72$ ).

Results of analysis variance (ANOVA) showed a significant relationship exists between self efficacy and socioeconomic status (SES). The results shows that there are significant differences in self efficacy among students with different SES backgrounds ( $F(6.16) > F$  critical,  $p = 0.003$ ). Results of analysis variance (ANOVA) also showed a significant relationship existed between achievement motivation with socioeconomic status. The results

shows that there are significant differences in achievement motivation among students with different SES backgrounds ( $F(4,516) > F_{\text{critical}}$ ,  $p = 0.012$ ).

In conclusion, the findings of the study found no significant differences in self efficacy and achievement motivation by gender and school location, but found significant differences in self efficacy and motivation achievement based on socioeconomic status (SES). Students from higher socioeconomic families showed better self efficacy and achievement motivation as compared to students from families of low socio-economic status.

## 5. Discussion

In general, the findings of this study support the theory that there is a relationship between self efficacy and achievement motivation. Findings also support the idea that self efficacy and achievement motivation has a relationship with student's achievement. Research findings also showed that there is a relationship between achievement motivation and student achievement in science subjects. This results indicating that the students who have a high achievement motivation will get a high achievement.

The important finding of this study is the existence of differences in terms of self efficacy and achievement motivation among students according to their socio-economic status groups. This result supported findings from research conducted by Juriah, Khalid, Zarin & Zanaton (2007) who found that the use of English in Science subjects was different according to their socioeconomic status. Students from high socio-economic status often more confident in using English when learning Science subjects. Parents with higher SES families entrust high hopes on the success of their children. On the contrary, children from low SES families tend to be lack of confident in the use of English. This will reduce the desire and motivation to learn especially in subjects that are taught in English.

At the same time, students who have high achievement motivation will be more successful compared to those with lower achievement motivation. What more if students are faced with a difficult task. This can be seen through the efforts made to solve a task. Students who have high self-efficacy will work hard to complete the tasks given contrary to those with lower achievement motivation. They will be very choosy and will only provide minimum feedback. Therefore, it is important to help students to identify their self-efficacy and achievement motivation in themselves so that they will be more confident and will continue to strive to achieve success. This is important to produce students who aspire to excel in their academic endeavor.

As a whole, the study found that self efficacy in the use of English are found to affect their achievement motivation that eventually will give impact to their achievement in Science subject which was taught in English. This finding supported the role of language in students learning process that is reflected through their performances. Therefore it is very important to address students language self efficacy especially in the context of the use of second language among the learners so that their performance can be optimized. Therefore, schools and teachers need to identify ways to raise students self efficacy and achievement motivation. The education policy makers also need to be more aware of the need of self efficacy and achievement motivation among students in implementing related policy in the education system.

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